1-1-1928

A suggested course of study in farm mechanics for high schools, based on the opinions of five hundred farmers

M A. Sharp
Iowa State University

A SUGGESTED COURSE OF STUDY IN FARM MECHANICS FOR HIGH SCHOOLS, BASED ON THE OPINIONS OF FIVE HUNDRED FARMERS.

By

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A Thesis Submitted to the Graduate Faculty

for the Degree of

Master of Science

in

Vocational Education

Approved:

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In charge of Major Work

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Head of Major Department

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Dean of Graduate College

Iowa State College
1928

INDEX

	Page
Introduction	3
Enrollment in high schools of U. S.	6
Research work by others to date	7
Methods of procedure	10
List of Iowa schools cooperating	11
Results	14
Questionnaire and summary of replies	16
Relative importance of shop projects	23
Discussion	28
Conclusions	29
Summary	30
Acknowledgments	31
Bibliography	32

INTRODUCTION

In 1917 the United States Congress passed a law providing for Federal Aid in Vocational Education, including Agriculture, Home Economics and Trades and Industries. This is commonly known as the Smith-Hughes Act.

As a part of the instruction in Agriculture, provision is made for teaching farm shop, and it is this phase of vocational education that is considered in this study.

When this law was passed there were no outlines of courses available, no men trained in this type of work, and no precedent to follow which would be of any assistance to those administering or teaching this subject. The name "farm shop" indicated clearly that the content of the course should deal with farm problems, and that there should be a distinction between this type of work and that commonly known as manual training.

This situation resulted in a great number of courses being outlined, no two of which were alike, and none of which have proven satisfactory. This was to be expected because very few of those in a position to outline courses of study knew much about farm life or farm mechanics. Those trained in educational principles knew very little about shop work, while the shop specialists knew very little about educational methods or the real problems of the farmer.

After ten years of operating under the Smith-Hughes act

there are no state outlines of farm shop work generally accepted as standard, no one man is recognized as an authority on this subject, and no theories regarding the proper content of a course of study have proven correct. However, those in charge of this work have not been idle or satisfied. Many courses of study have been written, and several surveys have been made. While there has been considerable improvement during the last few years, the situation at present is far from satisfactory, and will require years of effort before a course of study is worked out which will be acceptable to even a small majority of the states. Conditions vary so much between states and even within some states that a detailed outline of what should be taught can never be made satisfactory for all vocational agriculture departments. Certain problems and processes are common to nearly all farmers, but probably not more than fifty per cent of the content of any one course will ever be universally accepted.

Many men have worked on the theory that a universal course could be established and several textbooks have been written with that end in view. None of them have succeeded. Surveys made have been based almost entirely on the theory that we should find out just what jobs the farmer does, and what tools he has to work with, and then outline our course of study for high school boys, in accordance with these facts. This theory

is false because it is based upon past or present conditions and does not take into consideration the recent developments in farm machinery and the fact that most farmers would obtain the necessary tools and do many jobs now taken to town or left undone if they had the necessary knowledge and skills. A course of study in farm shop should be based on what a farmer should do rather than on what he now does. Since it is not possible for one man to be so well informed regarding the many and varying mechanical problems confronting thousands of farmers that he can suggest the best course of study to fit them for their life work, it is probable that one good source of information is the farmers themselves. The combined opinion of several hundred farmers should be a fairly safe criterion for judging the value of various mechanical problems, especially if we select those who are progressive.

Briefly stated, the chief problem of this study is to suggest a course of study in farm shop work, based on the combined opinions of five hundred farmers. The term "farm mechanics" has now come into quite general use in place of "farm shop", the former being more inclusive and more indicative of the type of work under discussion, and it will be used throughout the remainder of this thesis.

There are several reasons why this problem is well worth considering, some of which are:

1. There were 3339 vocational agriculture departments in the high schools of the U. S. in 1927. (1)

2. There were 86,986 boys enrolled in 1927, about 75 % of whom will become farmers. (1)

3. The total cost for this work in 1927 was $24,000,000.00. (1)

4. Considering the U. S. as a whole, twenty-seven per cent of the time given to vocational agriculture is allotted to farm mechanics. (2)

5. There is no standard course of study in farm mechanics, and the variation between courses is so wide that the need for research along this line is very evident.

6. We are wasting time, labor, and money, and failing in our mission to the farm boy because we do not know what we should teach him.

This study constitutes a very small amount of the work that must be done, but if it contributes even a little to the solution of the problem the time has been well spent.

A brief summary of what has been done along this line by others will show the general trend of investigational work to date.

(1) Federal Board for Vocational Education, Annual Report, 1927.

(2) Williams, C. V. Fundamentals Involved in the Organization and conduct of Vocational Agricultural Schools and Classes. State Board for Vocational Education, Topeka, Kans., 1925.

HISTORICAL

There has been very little research material published on the subject of farm mechanics. Nearly all states have a more or less detailed outline, most of them based on opinion rather than facts. These outlines may be obtained by writing to the State Supervisor of Agricultural Education in the various states, and it is not essential that they be listed here. Among the best are those in Nebraska, California, Ohio, and Kansas.

In the research field, all available reports are given in detail in "Teaching Farm Shop Work and Farm Mechanics" by Schmidt, Ross, and Sharp published by The Century Co., New York, August 1927. On pages 21 to 29 inclusive in this book are listed the results of surveys made in [1]Kans., [2]Minn., [3]Penn.,

1 Taken from "A Study of Farm Shop and Agricultural Engineering Activities on Kansas Farms" by A. P. Davidson, Associate Prof. of Voc. Ed., Kans. Ag. Col. Aug. 1925. A Thesis.

2 Taken from "Farm Repair and Construction Work" by F. E. Armstrong. Ed. Monograph 4, College of Education, The University of Minnesota, 1923. A thesis published in bulletin form and available for 50 cents.

3 Taken from "Farm Shop Work in Pennsylvania" by F. T. Struck. Sp. Bul. 1, Rural Life Department, The Pennsylvania State College, May 1920.

[4]Tenn., [5]Colo., and [6]Calif. The Colo. survey is comparable with the present one in that the farmers were asked to list the jobs they thought should be taught. However, this survey included only 200 farmers, and they were asked to check the jobs as yes or no. It is interesting to note that it checks very closely on many items with the results obtained from Iowa farmers. In the Minn. survey farmers were asked to list the jobs done in a certain year, while the other four differed from this only in that the list of jobs performed was not restricted to any certain period. These surveys show such a wide variation in the jobs farmers actually do in different states that they can hardly be considered of much value outside of the state in which they were made. It is not even possible to find any definite trends common to all. By comparing what the Colo. farmers thought should be taught with what those of other states actually did, it is very evident that many farmers do work they think should not be taught, and also that they want many jobs

4 Taken from "Principles Underlying a Course of Farm Shop Work in Vocational Agriculture" by H. C. Graybeal. Bulletin 2, Department of Agricultural Education, The University of Tennessee. August, 1925.

5 Taken from "Farm Shop Work in Vocational Agriculture" by L. R. Davies, State Supervisor of Agricultural Education, Colorado. May, 1923. A Thesis.

6 Taken from "Farm Mechanics for California Schools" Div. Bul. 11, Div. of Vocational Education, University of California. November, 1923.

taught which they are unable to do.

The California farmers were also asked to rank the various phases of farm mechanics work in their order of importance, which resulted as follows:

1. Farm machinery - repairs and adjustments.
2. Farm carpentry - construction and repairs.
3. Farm building - construction and repairs.
4. Farm blacksmithing.
5. Tractors - adjustments and repairs.
6. Concrete.
7. Harness repair.
8. Drawing.

[1]A thesis by J. A. Starrak, written in 1922, shows very clearly that there is need for improvement in farm mechanics in the high schools of Iowa. On page 14 of this thesis is a table showing how twenty Iowa farmers ranked 32 shop jobs. The ranking is comparable to the results of this survey. This thesis is quite complete over one consolidated school district, and should prove very helpful to those interested in farm mechanics.

Knowing what has been done by other states, it will be interesting to know what Iowa farmers think should be taught in their high school shops.

1 Starrak, J. A. A course in farm mechanics for classes in Vocational Agriculture in secondary schools. Unpublished Thesis. Library, Iowa State College, Ames, Iowa, 1922.

THE INVESTIGATION

Method of Procedure

In order to reach a large number of farmers well distributed over the state, progressive, and interested enough in the problem to fill out the questionnaires, it seemed advisable to work through the teachers of vocational agriculture and farm mechanics. Questionnaires were sent to them to be distributed among the farm boys in their classes. The boys took the questionnaires home, had their fathers fill them out, and then brought them back to the teacher, who returned them to the investigator.

On page 11 will be found a list of vocational agriculture departments, the number of questionnaires sent to each, and the number returned. The number of farm boys in the various departments was not known, but sufficient questionnaires were sent to be sure each boy would receive a copy. This accounts in part for the small percentage of returns.

TABLE NUMBER ONE

Vocational Agriculture Schools

1927 - 28.

School	Questionnaires	
	Sent	Returned
1. Ankeny	30	
2. Archer	15	9
3. Atlantic	20	
4. Audubon	20	3
5. Bedford	20	
6. Belle Plaine	20	12
7. Blakesburg	15	
8. Bloomfield	25	
9. Bonaparte	15	7
10. Bondurant	15	
11. Bridgewater	15	11
12. Buffalo Center	20	10
13. Castana	15	6
14. Clarinda	25	
15. Coin	15	
16. College Springs	15	6
17. Collins	15	
18. Corning	15	6
19. Cosgrove (P.O. Oxford)	15	
20. Cresco	30	
21. Dana	15	
22. Delhi	15	
23. Denison	20	15
24. Denmark	15	9
25. Donnellson	15	
26. Earlham	20	
27. Elliott	15	6
28. Farmington	25	13
29. Fort Madison	20	10
30. Garner	20	10
31. George	20	
32. Gilbert	20	
33. Glidden	25	
34. Gowrie	25	10
35. Grand Junction	25	5
36. Guthrie Center	25	

TABLE NUMBER ONE (Cont'd.)

School	Questionnaires	
	Sent	Returned
37. Hedrick	20	7
38. Hudson	20	10
39. Humboldt	25	13
40. Huron (P.O. Oakville)	15	
41. Huxley	15	10
42. Inwood	15	10
43. Jesup	15	8
44. Johnston	15	
45. Jordan	15	
46. Kelley	15	
47. LaMoille	15	
48. Lamoni	25	7
49. Lamont	15	5
50. Laurens	15	11
51. Lawton	15	6
52. Liberty Center	15	11
53. Liberty Con. (P.O. Merrill)	15	10
54. Lytton	15	6
55. Manilla	15	
56. Mapleton	20	9
57. Maquoketa	25	
58. Maxwell	15	4
59. Melvin	15	9
60. Mingo	15	
61. Monona	15	
62. Montezuma	20	
63. Montrose	15	10
64. Morning Sun	20	
65. Moulton	15	
66. Muscatine	25	13
67. Mystic	15	
68. Napier (P.O. Ames)	15	7
69. New Hampton	20	
70. New Providence	15	
71. Newton	20	11
72. Ocheyedan	20	9
73. Okoboji Twp. (P.O. Milford)	15	11
74. Oneida	15	
75. Orange Twp. (P.O. Waterloo)	15	
76. Ottosen	15	
77. Oxford	15	9

TABLE NUMBER ONE (Cont'd.)

School	Questionnaires	
	Sent	Returned
78. Paton	15	14
79. Plymouth	15	4
80. Postville	20	9
81. Radcliffe	40	
82. Red Oak	20	
83. Rippey	15	10
84. St. Charles	15	11
85. Sergeant Bluff	15	9
86. Sewal	15	
87. Shelby	15	8
88. Sigourney	15	
89. Sloan	15	
90. Stanhope	15	
91. Stanton	20	
92. Strahan	15	
93. Stratford	15	
94. Strawberry Point	20	
95. Stuart	20	13
96. Swea City	20	
97. Tabor	15	11
98. Tipton	50	
99. Ventura	15	11
100. Vinton	25	
101. Wales-Lincoln (P.O. Emerson)	15	
102. Waukee	20	13
103. Westfield	15	
104. West Liberty	25	
105. Whiting	20	
106. Winfield	15	
107. Winthrop	15	
108. Woodward	15	8
109. Yarmouth	20	4
Unidentified		21
Totals	1985	500

One group of seven, and one of fourteen were received but could not be identified. These were included in the summary.

On pages 15 to 20 will be found the questionnaire and summary of replies combined. While five hundred replies were received, the total number of opinions reported on any item does not reach this amount because many failed to report on all items listed. Also, in case an item had been marked in two columns, which often happened, neither placing was counted.

Results

Table No. 2 on pages 15 to 20 shows the summary of all replies received. Interpretation of the results would vary more or less with different men but a few points are so outstanding that there can be no question regarding the opinions of the majority of farmers. Some things shown very clearly are:

1. Farmers want their boys to be taught to do the type of work which they will be called upon to do as farmers.
2. They do not want their boys to receive instruction along lines of work which will be of little value to them as farmers.
3. Wood work is a minor part of the shop instruction which farmers think should be given to high school boys.
4. Furniture and cabinet making has no place in a farm mechanics course.
5. Repair work is more important than construction work.
6. There is a strong sentiment among farmers for an extensive course in farm mechanics in small high schools.

The Questionnaire Distributed to Farmers

Agricultural Engineering Department
Iowa State College
Ames, Iowa.

February 11, 1928.

Dear Mr. Farmer:

We want reliable information about the kind of shop work which should be taught in Vocational Agriculture Departments. We believe those farmers having boys taking this course are progressive, clear thinkers, and interested in agriculture or their boys would not be taking this kind of work. My work at Iowa State College is teaching Farm Mechanics to those men who are preparing to teach it to your boys. We want to know what you think should be taught in high school, that we may prepare these teachers to give you good service. The future should be considered as well as the present.

In order to take as little of your time as possible, we have listed a number of jobs or articles and wish you would make an X in the proper column according to your judgment. At present there is only an hour and a half each day for nine months available for teaching this work in high schools, so that only the most important parts can be taught. There is space at the end of the list for you to write in other articles or jobs which you think should be included.

When you are in Ames, be sure to visit the Agricultural Engineering Department. We have a large number of the newest farm machines on display as well as several experiments in which you will be interested. Ask your Farm Mechanics teacher to show you plans for the new clover seed huller and scarifier.

Thank you very much for your opinion of this list of shop jobs.

Sincerely,

M. A. Sharp
Assistant Professor

Final Summary

500 Replies

Please mark these jobs X according to their importance to farm boys taking Vocational Agriculture

	Important	Average	Of little value	Should not be taught
CONCRETE: Making				
fence posts	105	123	145	60
walls	179	141	71	32
foundations	301	99	32	19
garage floor	160	163	75	27
steps	167	147	68	38
bird bath	9	63	184	171
flower pot	10	75	193	141
garden bench	12	81	204	118
sundial	5	51	183	171
door stop	79	122	152	64
feeding floor	352	78	21	8
brick	61	129	148	80
building blocks	92	139	120	71
water tank	253	131	46	19
hog trough	231	129	65	17
laying building tile	148	153	83	45
laying brick	152	140	96	48
plastering	115	140	113	62
repairing plastered walls	148	157	82	45
reinforcing concrete	276	120	44	17
FORGE WORK: Making				
gate hook	147	147	82	43
staple	103	130	115	73
chain links	128	134	86	72
punch	138	144	82	57
Screw Driver	109	150	93	69
cold chisel	149	140	73	62
wrecking bar	135	142	83	68
hog hook	148	148	85	49
meat hook	126	153	97	48
chain repair link	162	127	80	57
bolt	134	149	82	56
endgate rod	131	161	93	46
clevis and pin	158	140	73	55
butcher knife	71	124	118	100

	Important	Average	Of little value	Should not be taught
retemper cold chisels	213	102	61	56
sharpen plow lay	250	105	48	50
sharpen cultivator shovels	263	103	41	41
welding	205	79	48	55
horseshoeing	161	143	76	71
general machine repairs	322	77	23	27
ELECTRIC WIRING				
Wire radio	130	151	90	52
Wire farm light plant	179	153	56	48
Wire house for lights	192	138	59	53
Wire barn for lights	191	133	62	50
Wire for door bell	94	128	138	63
GASOLINE ENGINES				
clean carbon	353	76	15	8
adjust valves	356	65	14	8
time valves	348	68	32	11
time ignition	354	66	25	11
grind valves	343	83	28	10
tighten connecting rod	351	75	15	8
and main bearings	349	76	16	8
adjust carburetor	368	62	10	9
clean carburetor	344	70	17	8
overhaul automobiles	279	119	29	25
overhaul tractors	291	96	25	26
GLASS				
cut glass	136	125	103	50
repair windows	195	130	70	30
HARNESS				
riveted splice	330	90	24	13
sewed splice	308	107	29	12
replace parts	313	106	24	7
new hame staple	254	126	31	12
oil harness	328	50	24	5
clean harness	304	103	33	8
PLUMBING				
cut and fit pipe	165	159	76	29
put on faucets	130	176	91	26
repair leaky faucet	159	175	68	25
install tank float	177	153	69	25

	Important	Average	Of little value	Should not be taught
install simple water system	201	129	64	28
install bathroom equipment	108	137	99	73
build septic tank	124	136	90	58
repair pump	279	101	36	18
replace cylinder leather	285	103	28	19
ROPE				
long splice for hay ropes	409	46	4	0
short splice	360	88	12	2
crown knot	268	143	36	7
sheep shank	232	143	45	12
bowline knot - will not slip or draw tight	375	70	5	2
timber hitch	269	122	27	10
square knot - will not slip	327	93	11	5
whip ends to prevent untwisting	348	76	17	3
SHEET METAL				
soldering	301	75	28	19
making "cut" acid	128	145	100	43
repairing milk pails	237	135	47	28
repairing water tanks	240	133	43	21
repairing tin roof	185	145	72	27
repairing copper tubing	142	147	106	33
making funnel	66	138	166	61
making tin cup	47	92	101	92
making cookie cutter	43	91	178	103
making ice box pan	58	119	151	85
making feed trough	128	111	64	26
TOOL SHARPENING: Sharpen				
hand rip saw	382	60	11	1
cross cut saw	396	54	8	1
cross cut wood saw	362	76	15	2
circle saw	282	106	48	13
buck saw	284	110	39	13
butcher knife	346	77	19	8
axe	384	53	11	6
hatchet	327	93	22	6
plane bit	351	78	19	4
chisel	349	84	10	5
wood auger bits	330	90	23	12
drill bits	334	83	20	11

	Important	Average	Of little value	Should not be taught
WOODWORK: Making				
saw horse	240	135	51	13
work bench	255	138	41	11
library table	81	163	127	44
foot stool	55	166	146	50
pedestal	63	153	151	50
plant stand	61	175	154	36
tabouret	49	152	158	58
milk stool	185	142	72	25
piano bench	60	127	133	71
ten kinds of joints	208	102	72	31
neck tie rack	51	117	165	72
cow stanchions	269	128	32	13
poultry self feeder	325	103	13	5
hog self feeder	339	81	11	5
hay rack	337	90	14	5
wagon box	301	109	23	12
side boards	289	111	35	9
end gates	284	114	31	12
new tongue	283	109	32	17
ladder	252	131	42	12
hog trough	323	95	17	4
hen nests	263	133	33	19
book case	75	154	142	52
magazine rack	62	168	140	49
wheel barrow	152	157	90	31
bob sled	100	123	129	75
spring seat	127	151	104	48
kitchen table	99	158	110	54
wash bench	135	173	84	27
stock loading chute	306	107	19	12
gate	315	93	18	9
radio cabinet	57	128	134	97
rocking chair	30	111	163	116
cedar chest	55	153	146	65
broom holder	59	157	151	45
chicken coop	220	175	27	7
movable hog house	342	91	10	8
garage	203	148	57	30
corn crib	251	114	45	26
barn	222	117	56	41
neck yoke	217	148	50	27

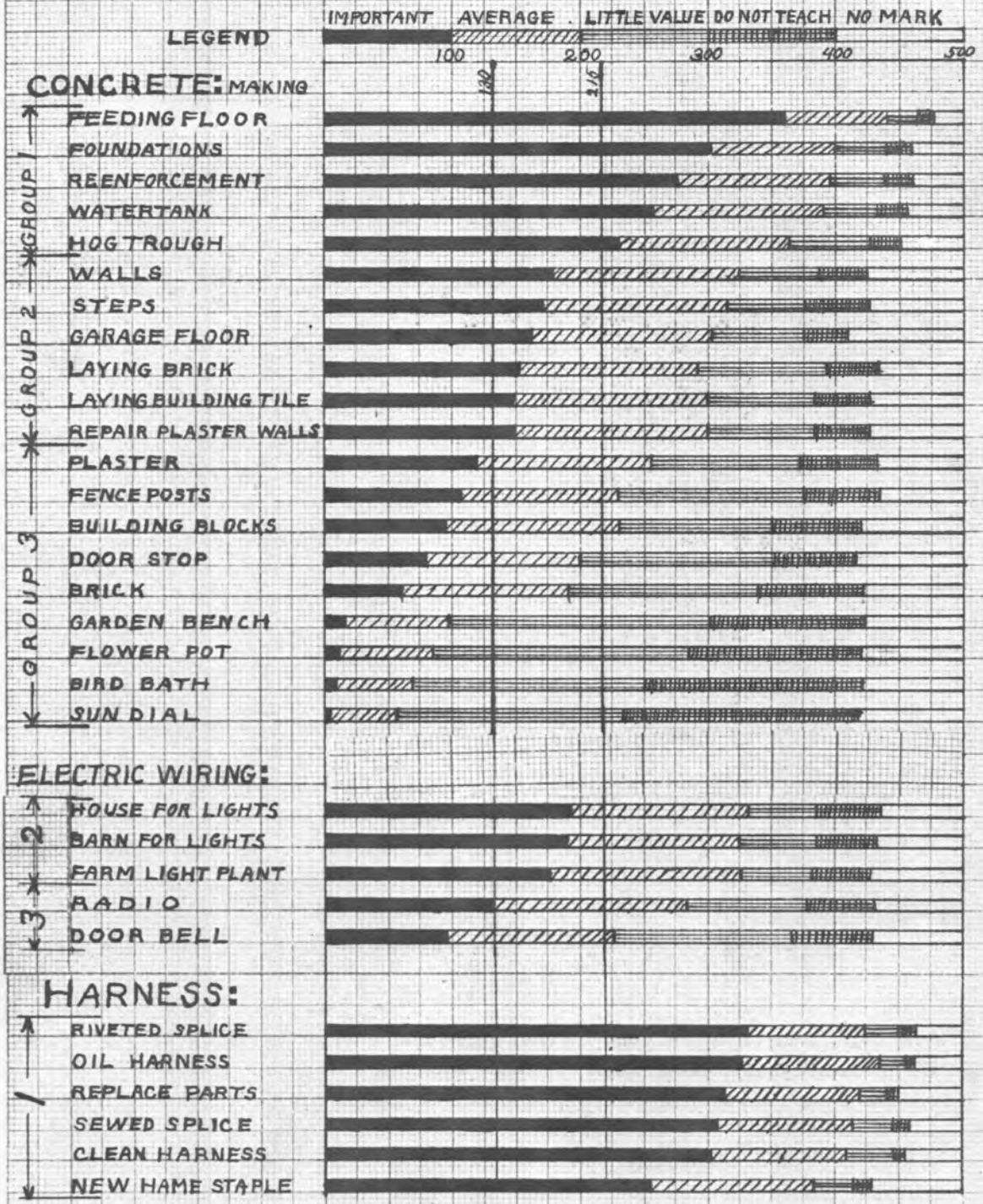
	Important	Average	Of little value	Should not be taught
double tree	272	125	28	18
single tree	259	128	53	16
hammer handle	217	123	69	21
nail box	169	153	71	29
medicine cabinet	101	158	109	45
tool chest	197	157	40	8
WOOD FINISHING: Applying				
stain	195	135	67	20
filler	192	149	67	21
varnish	218	140	50	23
wax	196	137	73	23
paint	304	91	29	16
mixing paint	314	84	29	15
REPAIRING MACHINERY				
make tongue	297	97	29	24
put in new tongue	340	75	19	14
babbitt bearings	228	112	84	26
figure speed of pulleys	272	108	43	20
lace belts with leather	329	88	18	8
lace belts with metal fasteners	291	110	32	5
repair wagon box	303	110	20	9
paint wagon	274	118	30	11
put on new mower sections	323	89	19	10
put new bushings in mower	275	117	36	11
complete overhaul of several farm machines	353	68	16	10
Drawing to scale	186	109	70	33
Free hand drawing	137	138	79	47

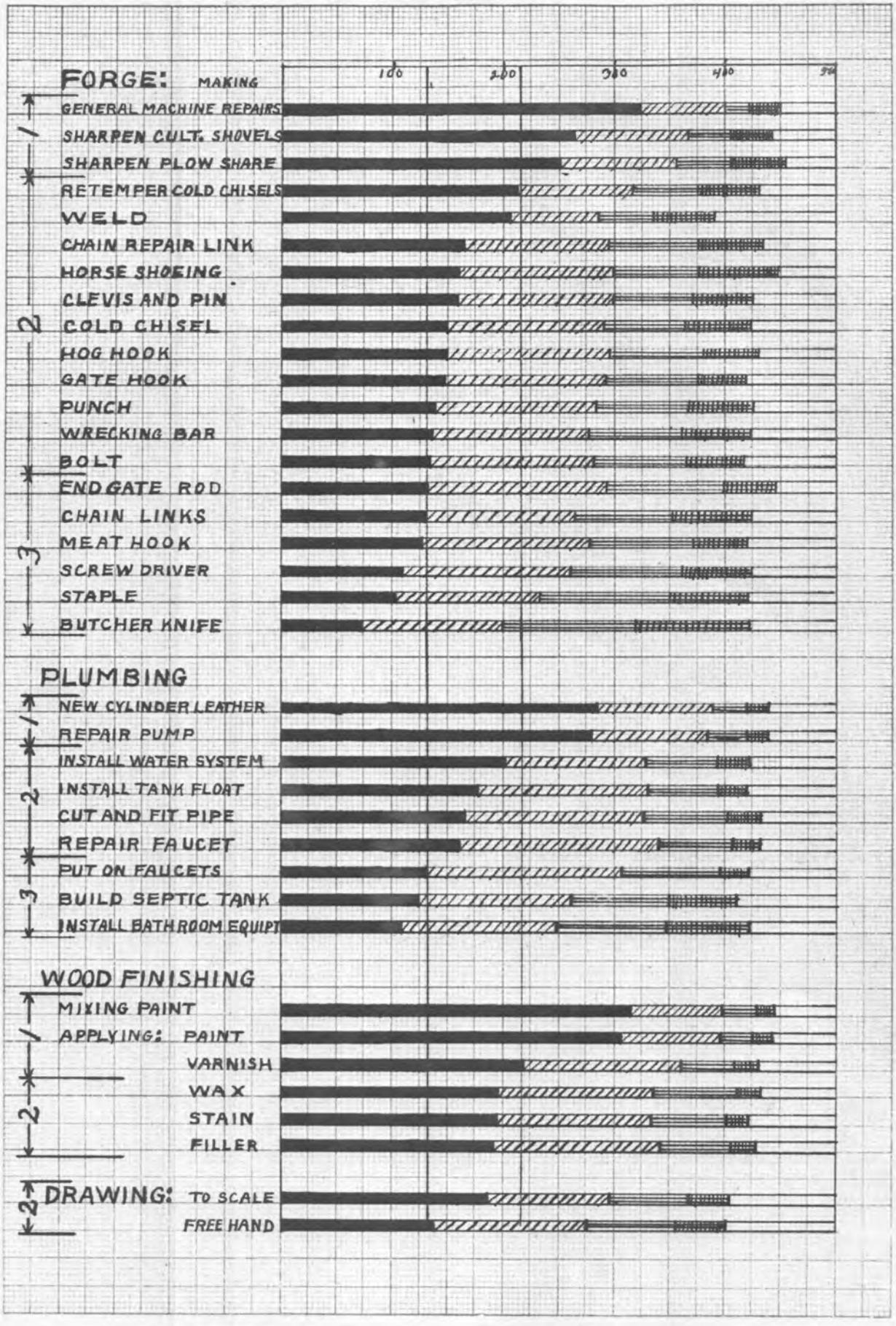
It is very evident that farmers want more work taught than can be covered in the time available, so it is necessary to select the most important jobs and build the course of study accordingly. In Iowa eighty minutes per day is given to this work in the ninth grade. The amount of time allowed varies in different states, but in general this is a fair average. In this study a rather simple method has been used to select the subject matter. In the summary of replies as shown in graphic form on page 23, the items have been arranged in order of importance. A line is drawn vertically through the table at a point representing the average number of marked replies. All those items which were marked "important" by more than 50% of those reporting are near the top, and marked group I. This is weighing the "important" column against all the others, which gives a very select group of projects. The suggested course of study is composed of the items marked group I under each of the main divisions or types of subject matter, However, there may be cases where this group would not be sufficient, and some items which may be quite desirable are not included. To give a more complete outline and allow for greater selection of projects a further classification is made by striking out the column marked "average", and weighing the "important" column against the other two. This is accomplished by drawing a second vertical line through the table

at a point which is approximately the average number of "important" marks needed to outweigh those in the last two columns. This figure is estimated after checking over several items and noting that the dividing line seems to be about 130 "important" marks. This second group, marked group 2 in the table is supplementary to group 1, and gives a list of items of secondary importance. Group 3 is of little importance, and these items should not be taught.

TABLE NO. 3

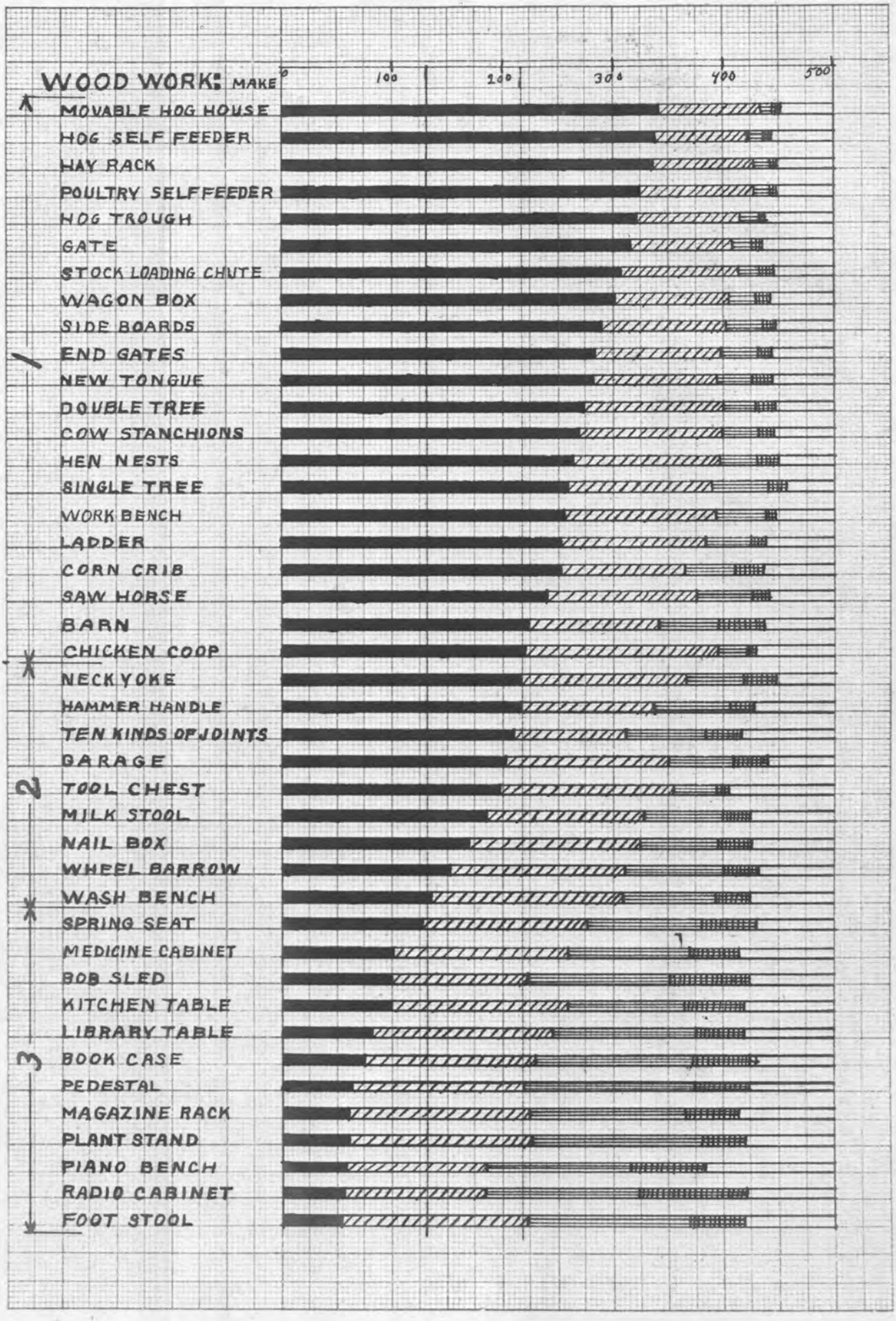
RELATIVE IMPORTANCE OF SHOP PROJECTS AND COURSE OF STUDY OUTLINE



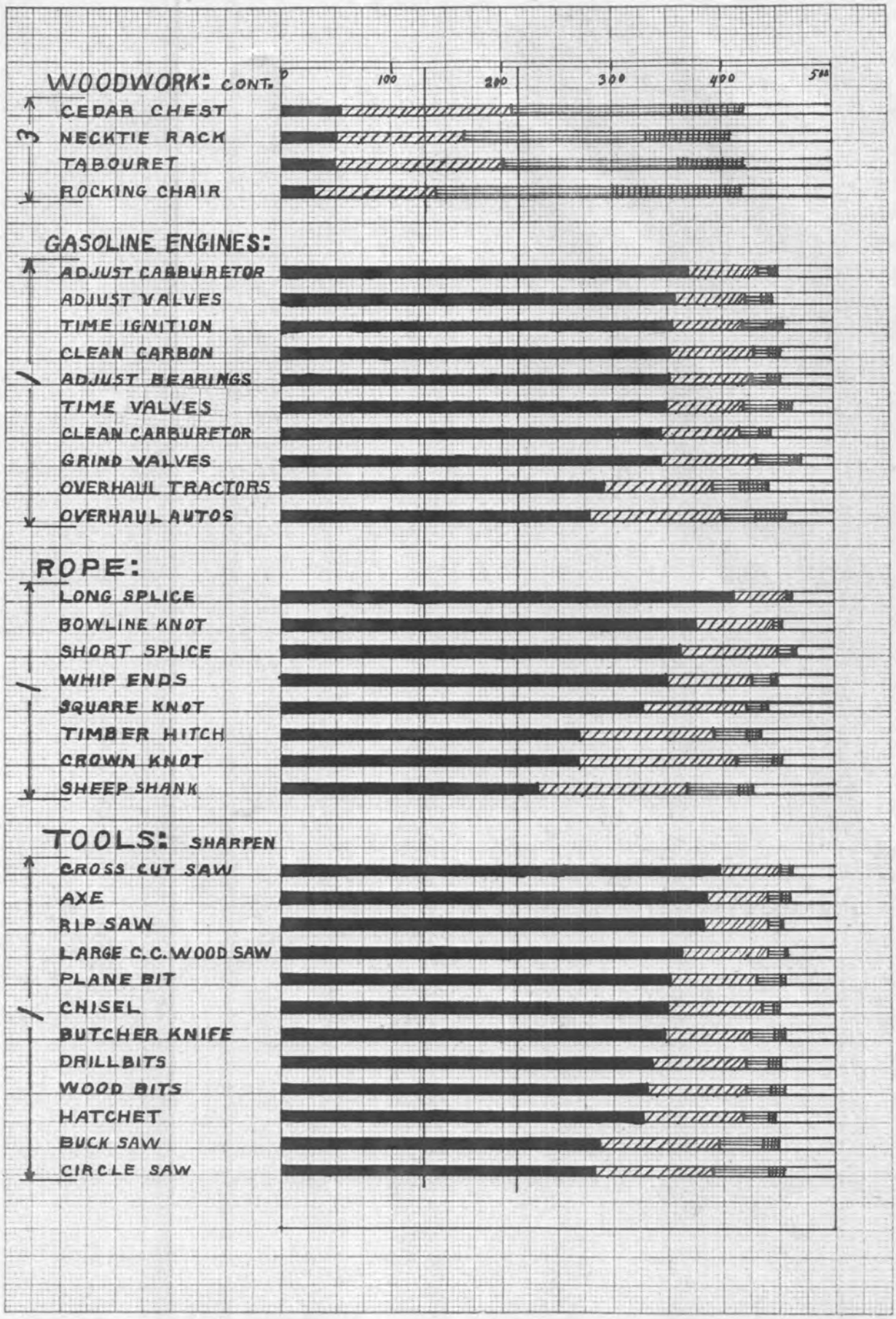

FORGE: MAKING
GENERAL MACHINE REPAIRS
SHARPEN CULT. SHOVELS
SHARPEN PLOW SHARE
RETEMPER COLD CHISELS
WELD
CHAIN REPAIR LINK
HORSE SHOEING
CLEVIS AND PIN
COLD CHISEL
HOG HOOK
GATE HOOK
PUNCH
WRECKING BAR
BOLT
END GATE ROD
CHAIN LINKS
MEAT HOOK
SCREW DRIVER
STAPLE
BUTCHER KNIFE
1
2
3
PLUMBING
NEW CYLINDER LEATHER
REPAIR PUMP
INSTALL WATER SYSTEM
INSTALL TANK FLOAT
CUT AND FIT PIPE
REPAIR FAUCET
PUT ON FAUCETS
BUILD SEPTIC TANK
INSTALL BATHROOM EQUIPT
1
2
3
WOOD FINISHING
MIXING PAINT
APPLYING: PAINT
VARNISH
WAX
STAIN
FILLER
1
2
DRAWING: TO SCALE
FREE HAND
2

Form E-3

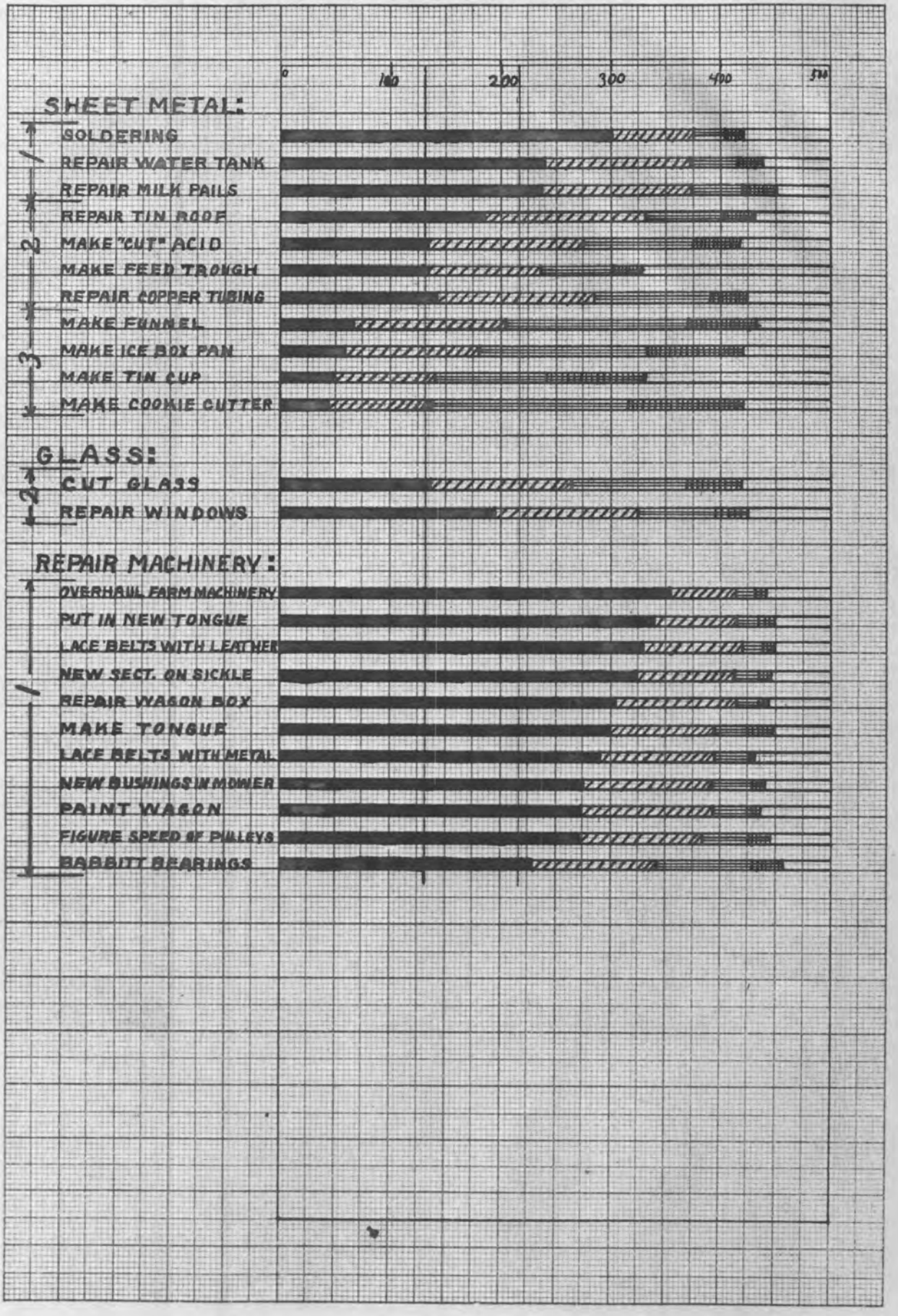
25


WOOD WORK: MAKE
0
100
200
300
400
500
MOVABLE HOG HOUSE
HOG SELF FEEDER
HAY RACK
POULTRY SELFFEEDER
HOG TROUGH
GATE
STOCK LOADING CHUTE
WAGON BOX
SIDE BOARDS
END GATES
NEW TONGUE
DOUBLE TREE
COW STANCHIONS
HEN NESTS
SINGLE TREE
WORK BENCH
LADDER
CORN CRIB
SAW HORSE
BARN
CHICKEN COOP
NECKYOKE
HAMMER HANDLE
TEN KINDS OF JOINTS
GARAGE
TOOL CHEST
MILK STOOL
NAIL BOX
WHEEL BARROW
WASH BENCH
SPRING SEAT
MEDICINE CABINET
BOB SLED
KITCHEN TABLE
LIBRARY TABLE
BOOK CASE
PEDESTAL
MAGAZINE RACK
PLANT STAND
PIANO BENCH
RADIO CABINET
FOOT STOOL
1
2
3

Form E-3


0
100
200
300
400
500
WOODWORK: CONT.
CEDAR CHEST
NECKTIE RACK
TABOURET
ROCKING CHAIR
GASOLINE ENGINES:
ADJUST CARBURETOR
ADJUST VALVES
TIME IGNITION
CLEAN CARBON
ADJUST BEARINGS
TIME VALVES
CLEAN CARBURETOR
GRIND VALVES
OVERHAUL TRACTORS
OVERHAUL AUTOS
ROPE:
LONG SPLICE
BOWLINE KNOT
SHORT SPLICE
WHIP ENDS
SQUARE KNOT
TIMBER HITCH
CROWN KNOT
SHEEP SHANK
TOOLS: SHARPEN
CROSS CUT SAW
AXE
RIP SAW
LARGE C.C. WOOD SAW
PLANE BIT
CHISEL
BUTCHER KNIFE
DRILL BITS
WOOD BITS
HATCHET
BUCK SAW
CIRCLE SAW

Form E-3


0
100
200
300
400
500
SHEET METAL:
SOLDERING
REPAIR WATER TANK
REPAIR MILK PAILS
REPAIR TIN ROOF
MAKE "CUT" ACID
MAKE FEED TROUGH
REPAIR COPPER TUBING
MAKE FUNNEL
MAKE ICE BOX PAN
MAKE TIN CUP
MAKE COOKIE CUTTER
GLASS:
CUT GLASS
REPAIR WINDOWS
REPAIR MACHINERY:
OVERHAUL FARM MACHINERY
PUT IN NEW TONGUE
LACE BELTS WITH LEATHER
NEW SECT. ON SICKLE
REPAIR WAGON BOX
MAKE TONGUE
LACE BELTS WITH METAL
NEW BUSHINGS IN MOWER
PAINT WAGON
FIGURE SPEED OF PULLEYS
BABBITT BEARINGS

DISCUSSION

In general the result of this study is satisfactory. It shows very clearly what kind of work farmers want taught in high schools, and emphasizes the practical side of shop work. The number of replies and their distribution is a fair cross section of Iowa farmers. While there were a few replies having indications that they were answered by students, the number was negligible. That practically every type of shop job the farmer is interested in was included in the questionnaire is indicated by the fact that there were no additional items mentioned more than three times.

Some terms were used which the majority of farmers did not understand, as indicated by final results and individual replies. Door stop, sheep shank, crown knot, whip ends, and "cut" acid were not understood. "Ten kinds of joints" was not understood, as shown by the fact that 208 farmers marked this item "important", while all articles of furniture, on which these joints would be used, were voted out of the course.

The questionnaire was as long as farmers can be expected to fill out, several indicating that it was too detailed. It is probable that 250 replies would have been just as accurate as 500, since there was no appreciable change in relative values beyond this number.

CONCLUSIONS

There are several definite conclusions to be drawn from this study, most of which are as follows:

1. The farmer would eliminate all furniture and cabinet making from high school shop courses. This tendency is very decided.

2. The farmer would make the shop courses intensely practical, eliminating all such articles as necktie racks, funnels, tin cups, butcher knives, and others that may be purchased much more cheaply than they may be made.

3. The farmer is not interested in having his boy taught to make things which have more cultural than practical value.

4. Repair work is much more important than construction work.

5. The course of study in farm mechanics should be composed of those items in Table III marked group 1, with those marked group 2 as supplementary. None of those in group 3 should be taught.

For convenience the entire list of items is outlined here by groups.

CONCRETE

Group
1. Feeding floor
Foundations
Reenforcement
Watertank
Hog trough

2. Walls
Steps
Garage floor
Laying brick
Laying building tile
Repair plaster walls

3. Plaster
Fence posts
Building blocks
Door stop
Brick
Garden bench
Flower pot
Bird bath
Sundial

ELECTRIC WIRING

Group
2. House for lights
Barn for lights
Farm light plant

3. Radio
Door bell

HARNESS

Group
1. Riveted splice
Oil harness
Replace parts
Sewed splice
Clean harness
New hame staple

FORGE

Group
1. General machine repairs
Sharpen cult. shovels
Sharpen plow share

2. Retemper cold chisels
Weld
Chain repair link
Horse shoeing
Clevis and pin

Cold chisel
Hog hook
Gate hook
Punch
Wrecking bar
Bolt

3. Endgate rod
Chain links
Meat hook
Screw driver
Staple
Butcher knife

PLUMBING

Group
1. New cylinder leather
Repair pump

2. Install water system
Install tank float
Cut and fit pipe
Repair faucet

3. Put on faucets
Build septic tank
Install bathroom equipment

WOOD FINISHING

Group
1. Mixing paint
Applying: paint
varnish

2. wax
stain
filler

DRAWING

Group
2. To scale
Free hand

WOOD WORK

Group
1. Movable hog house
Hog self feeder
Hay rack

Poultry self feeder
Hog trough
Gate
Stock loading chute
Wagon box
Side boards
End gates
New tongue
Double tree
Cow stanchions
Hen nests
Single tree
Work bench
Ladder
Corn crib
Saw horse
Barn
Chicken coop

2. Neckyoke
Hammer handle
Ten kinds of joints
Garage
Tool chest
Milk stool
Nail box
Wheel barrow
Wash bench

3. Spring seat
Medicine cabinet
Bob sled
Kitchen table
Library table
Book case
Pedestal
Magazine rack
Plant stand
Piano bench
Radio cabinet
Foot stool
Cedar chest
Necktie rack
Tabouret
Rocking chair

GASOLINE ENGINES

Group	
1.	Adjust carburetor
	Adjust valves
	Time ignition
	Clean carbon
	Adjust bearings
	Time valves
	Clean carburetor
	Grind valves
	Overhaul tractors
	Overhaul autos

ROPE

Group	
1.	Long splice
	Bowline knot
	Short splice
	Whip ends
	Square knot
	Timber hitch
	Crown knot
	Sheep shank

TOOLS

Group	
1.	Sharpen -
	Cross cut saw
	Axe
	Rip saw
	Large c. c. wood saw
	Plane bit
	Chisel
	Butcher knife
	Drill bits
	Wood bits
	Hatchet
	Buck saw
	Circle saw

SHEET METAL

Group	
1.	Soldering
	Repair water tank
	Repair milk pails

2. Repair tin roof
Make "cut" acid
Make feed trough
Repair copper tubing

3. Make funnel
Make ice box pan
Make tin cup
Make cookie cutter

GLASS

Group
2. Cut glass
Repair windows

REPAIR MACHINERY

Group
1. Overhaul farm machinery
Put in new tongue
Lace belts with leather
New Sect. on sickle
Repair wagon box
Make tongue
Lace belts with metal
New bushings in mower
Paint wagon
Figure speed of pulleys
Babbitt bearings

SUMMARY

This study includes:

1. Reasons for undertaking the study.

2. A citation of published reports of similar investigations, showing that very little work has been done along this line.

3. An explanation of how the data were gathered, and a summary of the same.

4. A recommended course of study in farm mechanics for high schools, based on the summary of replies received from five hundred farmers.

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